Approved For Release 2006/06/28 : CIA-RDP78B04770A002900020034-3

[redacted] STAT

December 8, 1964

[redacted] STAT

Re: Contract [redacted] STAT

Dear Sir:

Enclosed are five copies of a Preliminary Technical Report on Item 2 of Task II of the subject contract. The report title is "Signal Strength of Broadcast Radiation of Closed-Circuit TV" and it indicates test data available and equipment availability for testing. The enclosed report is submitted in accordance with the requirements of the subject contract.

Very truly yours

[redacted] STAT

WAS:ws
Enclosures

DDR - NOT A DUPE

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[redacted] STAT

November 30, 1964

[redacted] STAT

Preliminary Technical Report

on

Item 2. Signal Strength of Broadcast Radiation of Closed-Circuit TV.

Item 2 Work Statement: Determine test facilities needed and rental cost and closed-circuit TV equipment needed and rental cost (if any) on loan arrangements. Determine what applicable data are available from manufacturers.

Submitted by:

[redacted] STAT

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Task II, Item 2

Preliminary Technical Report

1. Introduction

It is not presently known whether or not closed-circuit TV equipment (CCTV) radiates electromagnetic or electrostatic signals that would be undesirable under your contemplated use. Task II item 2 was therefore undertaken to determine what data was available on common commercial items and what testing would be required to obtain adequate data.

Fed Std No. 222 was recently established and it specified acceptable radiation signal levels. The standard is an excellent objective criterion. It is subject to interpretation as to what type of signal is significant for specific applications.

For your application it appears that only a signal with video content would be significant. Switching transients, synchronizing pulses, and sweep signals with no video content would be considered non-significant.

2. Summary Review

Test data on electomagnetic emanations from closed circuit television equipment are not commonly available. From the little data that is available, it is not possible to determine if video information is at levels above that specified in Fed Std No. 222 or if it exists in the emanations at all. To find out it will be necessary to conduct tests.

A number of commercial environmental laboratories are equipped to measure the electromagnetic and electrostatic emanations from equipment. The rental rates for testing in a screen room are approximately $12.50/hour to $15.65/hour for the room and test equipment, plus $12.50/hour to $15/hour for a test engineer's time. Fed Std No. 222 is a new spec and only a few labs are familiar with it and qualified to test to it.

Closed circuit television equipment costs between [redacted] for one camera and one monitor complete, excluding cabling and accessories. The high resolution systems are the more expensive. There are many manufacturers and many options in equipment available. The highest resolution shelf item is about 945 TV lines. [redacted] have more experience than most others in meeting the military RFI specifications for low radiated STAT STAT STAT

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noise such as MIL-I-26600. The manufacturers prefer not to lease their equipment but generally seem willing to make demonstration models available for a short period at no charge for RFI tests if they may receive copies of the test report.

In order to define more accurately facilities and equipment required, a pilot test program will be prepared and submitted at a future date. Actual conduct of the test by us is not considered as it is not within the scope of this task. The pilot test will measure the electromagnetic and electrostatic video emanations from one representative CCTV camera and monitor to determine whether a shelf item conforms to the intent of Fed Std No. 222.

3. Test Data Available

Inquiries were sent to a number of companies requesting technical information on closed circuit television equipment of their manufacture. Particular reference was made to radio frequency emanations from the equipment and any tests which would provide pertinent data. Only one manufacturer, [redacted] STAT indicated they had conducted any radio frequency noise tests.

[redacted] STAT had tested a Master Monitor M 17 CR with a conductive-coated screen for [redacted] STAT in 1959. Specifically, they were measuring the interfering field emanating from the deflection coils of a TV monitor through the CRT face and the attenuation afforded by a conductive coating on the face.

The conductive coating greatly reduced the electric field as measured, but radiations for both coated and uncoated screens were considerably in excess of the limits quoted in Fed Std No. 222. The conclusions were that the conductive coating did attenuate the electrostatic field, but did not attenuate the electro-magnetic field. They also concluded that more effective attenuation of the electrostatic field might be obtained with heavier coatings, but the heavier coatings would obscure the face of the tube.

The [redacted] STAT test is a good example of the problems of determining the conformance of equipments to the intent of Fed Std No. 222. The detected signals were identified as narrow band CW and the basic frequency was the horizontal sweep rate. If the emanations are truly CW with no video superimposed, then they do not violate the intent of Fed Std No. 222. There was no indication that video emanations (which are broadband) were detected during the tests.

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4. Test Lab Facilities

Inquiries were initiated into the facilities and equipment available for testing closed circuit TV components to Fed Std No. 222. Some of the test equipment required is new and highly specialized and not many test labs are equipped. I was told there are only five labs in the United States qualified to test to Fed Std No. 222.

Two laboratories in the local area appeared to be the most knowledgeable. One was [redacted] STAT
[redacted] which is a commercial testing laboratory STAT
specializing in environmental testing. [redacted] stated STAT
they were fully equipped (except for sound intensity and subaudio) and qualified to test to Fed Std No. 222 and [redacted] STAT
had two year's experience at it. Their rates are [redacted]
for equipment, [redacted] for a test engineer and [redacted] STAT
hour for a project engineer.

The other knowledgeable organization was [redacted] STAT
[redacted] STAT
lab is principally for in-house use on their own programs and scheduling test time would be a problem. [redacted] has STAT
not established any rates but indicated that testing to MIL Std No. 222 was very expensive. The expense, however, probably results from trying to qualify equipment to the required radiation limits. [redacted] indicated that the expense STAT
and complexity of testing depended on the customer's interpretation of the Federal Standard.

[redacted] indicated that their [redacted] STAT
[redacted] was not equipped to test STAT
to Fed Std No. 222. They are planning to equip only one lab at present and this will be their Washington Development Center. The address is:

[redacted] STAT

[redacted] indicated that the [redacted] STAT
new and just getting into operation. He is still in the process of equipping it and obtaining facility clearance. He indicated that the piece of classified test equipment required for Fed Std No. 222 was available to him but was not yet on-site.

[redacted] rates are [redacted] for facility and STAT
equipment for Fed Std No. 222 testing, [redacted] for STAT
engineering time, and [redacted] for test technician's time. STAT

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Other test labs contacted were either unfamiliar with Fed Std No. 222 or were evasive. It is entirely possible, however, that many of them could do an entirely adequate job of testing for radio frequency emanations from closed circuit TV equipment for the specific usage conditions contemplated.

5. Closed Circuit TV Equipment (CCTV)

5.1 [redacted] has CCTV equipment at many missile bases. Much of their equipment was developed to MIL-E-5272 and qualified to RFI specification MIL-I-26600. I would expect their equipment to be about as low in RFI emanations as any shelf item available. STAT

Model 712 Closed Circuit Television System
TV camera model 0443A with RCA Vidicon tube and wide angle f/1.2 lens. 17 inch rack mounted Monitor. Sync generator, camera control, and remote control station.

Approximate price: [redacted] STAT

The cabling and accessories are in addition to the above price. This is a 650 line, 10 megacycle bandwidth system.

5.2 [redacted] STAT
California, have sold CCTV equipment that meets RFI spec MIL-I-26600 but they have not been certified to this spec and test data are not available.

High Resolution CCTV System TV camera, 3100 series, with Vidicon tube, self-contained, and wide angle f/1.4 lens. 17 inch cabinet mounted Monitor Model HRM 17, shielded for low RFI.

Approximate price: [redacted] STAT

Cabling and accessories are in addition to above price. This is a high resolution 945 line 20 megacycle bandwidth system. [redacted] will not lease equipment for less than three months and then the cost is high because they must charge for refurbishing. The Sales Department will make equipment available for a few days at no charge for an RFI test, if they can have a copy of the test report. The monitor is normally the principal RFI offender and [redacted] includes shielding, filtering, and sputtered gold on the tube face as a special order item to reduce noise. STAT STAT

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5.3 [redacted] makes a line of CCTV equipment but had no information regarding radio frequency emanations from the equipment. STAT

[redacted] Type TK202 Basic Industrial System STAT
TV camera type tk202 with [redacted] Vidicon tube STAT
and wide angle f/1.5 lens. 17 inch rack mounted Monitor type TM7ER. Camera control unit and fan.

Approximate price: [redacted] STAT

The cabling and accessories are in addition to the above price. This is a 525 line, 8 megacycle bandwidth system. Probably no particular precautions were taken to obtain low radiated noise or high resolution.

5.4 [redacted] STAT
makes a line of high resolution CCTV equipment, but they have not had occasion to measure the radio frequency field strength emanating from their cameras, monitors, or cables.

High Resolution CCTV System TV camera type 24A with vidicon tube and wide angle f/1.9 lens. High resolution 17 inch cabinet mounted Monitor model 30B-1/17N.

Approximate price: [redacted] STAT

The cabling and accessories are in addition to the above price. This is a 945 line or 1029 line, 18 megacycle bandwidth system.

5.5 Information from several other manufacturers was received and the foregoing is representative. The higher resolution systems are considerably more expensive than the 525 line systems and RFI shielding also costs more.

It would probably be better to use a high resolution system for radiated noise tests. I believe that the [redacted] Model 3100 CCTV camera and Model HRM17 Monitor STAT
would provide representative data in a pilot test to determine the general magnitude of the problem. This is a high resolution 945 line wide band 20 megacycle system. It also comes in a shielded version which could be tested in a second phase if it seemed desirable to obtain data with the radiations suppressed.

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6. Remaining Work

A pilot test program will be prepared for the testing of one CCTV camera and monitor in a screen room. The program will define the tests necessary to determine whether the equipment conforms to the intent of Fed Std No. 222.

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